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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference AFB/P8943WO | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/GB 03/01883 | International filing date (day/month/year) 01.05.2003 | Priority date (day/month/year) 01.05.2002 |
| International Patent Classification (IPC) or both national classification and IPC F17C7/00 | | |
| Applicant AIR PRODUCTS AND CHEMICALS, INC. et al. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains Indications relating to the following items:

I Basis of the opinion
II Priority
III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV Lack of unity of invention
V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI Certain documents cited
VII Certain defects in the international application
VIII Certain observations on the international application

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| Date of submission of the demand 27.11.2003 | Date of completion of this report 19.08.2004 |
| Name and mailing address of the International preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Azaïzia, M Telephone No. +49 89 2399-6960 |



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB 03/01883

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-18 as originally filed

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

the entire international application,

claims Nos. 12

because:

the said international application, or the said claims Nos. 12 relate to the following subject matter which does not require an international preliminary examination (specify):

see separate sheet

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

no international search report has been established for the said claims Nos. 12

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

the written form has not been furnished or does not comply with the Standard.

the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 1-11, 13-18

No: Claims

Inventive step (IS) Yes: Claims 1-11, 13-18

No: Claims

Industrial applicability (IA) Yes: Claims 1-11, 13-18

No: Claims

2. Citations and explanations

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see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. No International Preliminary Examining Authority shall be required to carry out an international preliminary examination on an international application if, and to the extend to which, its subject-matter is a method for treatment of the human or animal body by surgery or therapy, as well as a diagnostic method (Rule 67.1(iv) PCT). This is the case in the present application with regard to method claim 12 which relates to **the cardiopulmonary bypass oxygenation and/or the artificial ventilation of a patient** (cf. for example the description on page 4, line 29 to page 5, line 2 and figure 3).
 - (I) The applicant argues that none of the present claims relate to a method of medical treatment since, although the processing apparatus can be a cardiopulmonary bypass oxygenator, artificial ventilator or similar medical equipment, all of the steps of methods within the method claims are of a technical character such as to be carried out without any contribution from a medical practitioner. Nevertheless, independent method claim 12 is applied to dispense a first gas (such as a mixture of xenon and oxygen) to a **cardiopulmonary bypass oxygenator and/or an artificial ventilator** in order to carry out **the cardiopulmonary bypass oxygenation and/or the artificial ventilation of a patient**. Therefore, the step of "*dispensing the first gas from the first compartment via a gas outlet of the container and providing the first gas to a processing apparatus for carrying out a process involving the first gas*" represents at least a step of medical treatment by therapy, which treatment must be carried out by a physician.
 - (ii) Independent method claim 12 is therefore considered as a method for the treatment of the human body by therapy in the sense of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of this claim (Article 34(4)(a)(i) PCT).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2. The opinion with regard to novelty, inventive step and industrial applicability according to Article 35(2) PCT is given concerning the subject-matter of method claims 1-11, 13 and 14 for the cases in which no use for therapeutical and/or surgical purposes on the human and/or animal body is intended (Article 34(4)(a)(i) PCT). In fact, for the same reasons as given under Re Item III, method claims 1-11, 13 and 14 are considered as methods for the treatment of the human body by therapy in the sense of Rule 67.1(iv) PCT when they are applied for the cardiopulmonary bypass oxygenation and/or the artificial ventilation of a patient (cf. for example the description on page 4, line 29 to page 5, line 2 and figure 3).

However, since method claims 1-11, 13 and 14 are also intended for use with gas separation or purification apparatus (cf. the description on page 5, line 4 to line 6), an opinion concerning their subject-matters is given for the cases in which no use for therapeutical and/or surgical purposes on the human and/or animal body is intended.

In order to clearly and unambiguously define these cases, it would have been appropriate to disclaim the therapeutical and/or the surgical processes from the present method claims by defining for example "a method of storing and dispensing a first gas **for use in a non-therapeutical and/or non-surgical process** and receiving and storing a second gas **recovered from this non-therapeutical and/or non-surgical process**". For the purposes of this examination, method claims 1-11, 13 and 14 have been interpreted as such.

2.1 Concerning method claim 13, it is noted that a "use" claim of a form such^o as "use of a container for storing and dispensing a first gas for use in a process and receiving and storing a second gas recovered from said process, wherein said container comprises ..." is regarded as equivalent to a "method" claim of the form "method of storing and dispensing a first gas for use in a process and receiving and storing a second gas recovered from said process, using a container comprising ...", wherein the part "**for storing and dispensing a first gas for use in a process and receiving and storing a second gas recovered from said process...**" is interpreted as defining the method steps of the claimed method.

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3. Reference is made to the following document:
D1: EP-A-1 041 337, cited by the applicant.
4. The document D1 is concerned with overcoming the problem of compensating for the temperature rise that occurs on quick filling of the compressed gas tank of a vehicle from a compressed gas reservoir. The solution proposed in D1 is to divide the tank (2) into first and second compartments (6, 7) by a movable heat-insulating partition (5; 15). In the embodiments of Figures 1 and 3 to 5, the partition is a flexible membrane (5). One of the compartments (6) is filled (via components 11, 9, 13 and 3) with gas from the reservoir (10) but the heat generated by that filling is contained by the heat-insulating partition (5; 15). When the first compartment (6) is filled to the desired extend, gas is fed (via components 12, 16 and 4) to the second compartment (7) whilst gas from the first compartment (6) is returned to the reservoir (10). It is specially stated in D1 that the reservoir (10) is substantially larger than the tank (2) so that filling of the tank from the reservoir does not cause any significant pressure drop in the reservoir (see §[0014]).

The subject-matter of independent claim 1 differs from D1 in that the gas withdrawn from the first compartment (6) is thus **not** provided to a processing apparatus. It is merely returned to the storage reservoir (10). Similarly, the gas fed to the second compartment (7) is provided by the storage reservoir (10) and has **not** been recovered from any processing apparatus. The displacement of the partition (5) permitting filling of the tank with cold gas to replace hot gas removed from the first compartment occurs within the tank (2) and the tank does **not** constitute processing apparatus as required by the independent claim 1.

The subject-matter of independent claim 1 is therefore new (Article 33(2) PCT). Furthermore, independent claim 1 involves an inventive step in the sense of Article 33(3) PCT in that there is no teaching in D1 that would have led the skilled person to consider using a tank (2) to provide a gas supply to a processing apparatus and to store, in a separate compartment, gas recovered from that processing apparatus. The objective problem of D1, namely the quick filling of a compressed gas vehicle tank from gas storage reservoir, is remote from that of the present invention, namely the use of a single container for both supply of gas to and recovery of used gas from a processing apparatus.

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Consequently, the independent claim 1 meets the requirements of the PCT with respect to novelty (Article 33(2) PCT) and inventive step (Article 33(3) PCT).

- 4.1 Claims 2-11 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
- 4.2 The same reasoning applies, mutatis mutandis to the subject-matter of:
 - (i) the corresponding independent method claim 13 and its dependent claim 14, which are therefore also considered new (Art.33(2) PCT) and inventive (Art.33(3) PCT).
 - (ii) the independent apparatus claim 15 and its dependent claims 16-18, which are therefore also considered new (Art.33(2) PCT) and inventive (Art.33(3) PCT).
5. The subject-matter of claims 1-11 and 13-18 is considered industrially applicable since it can be made or used in any kind of industry (Article 33(4) PCT).

----- **Certain defects in the international application (form and content)** -----

6. The document WO-A-96/22929 introduced by the applicant and reflecting the prior art described on page 1, lines 19-25, is not identified in the description (Rule 5.1(a)(ii) PCT).
7. The independent claims 1, 13 and 15 are not in the two-part form in accordance with Rule 6.3(b) PCT, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
8. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

----- **Certain observations on the international application (clarity)** -----

9. Although claims 1 and 13 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness. Moreover, lack of clarity of the

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claims as a whole arises, since the plurality of independent claims makes it difficult to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection.

Hence, claims 1 and 13 do not meet the requirements of Article 6 PCT.

- 9.1 In order to overcome this objection, it would have been appropriate to file an amended set of claims defining the relevant subject-matter in terms of a single independent claim in each category followed by dependent claims covering features which are merely optional (Rule 6.4 PCT). In the present case, it would have been appropriate to delete independent method claim 13 since method claim 13 does not clearly define the method steps which are necessary for the definition of the invention for which protection is sought (Article 6 PCT).
10. In order to comply with the clarity requirement of the description (Article 5 PCT), it would have been appropriate to have additionally expressed the signification of the unit "litres NTP" used in the description on page 4, namely "litres at Normal Temperature and Pressure (NTP) conditions".
11. The vague statement "within the **spirit** ... of the following claims" used in the description on page 13, line 30 to line 31, implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (cf. the PCT Guidelines, III-4.3a). In order to overcome this objection, it would have been appropriate to delete this statement from the description.